

REMARKS**Claim Status**

Claims 24-46 are pending in the application. Claims 31-40, 45 and 46 were withdrawn by the Examiner as being drawn to a non-elected invention. Claims 25-29 have been amended. New Claim 47 has been added.

Claim Amendments

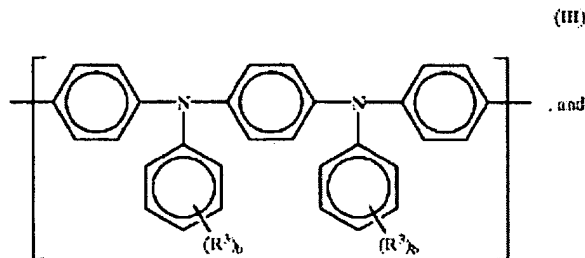
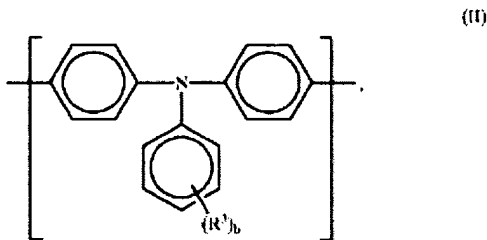
Claims 25-29 have been amended to have a correct dependency on Claim 24.

Claim 47 has been added to be directed to the subject matter of previously presented Claim 24, including the subject matter of previously presented Claim 28.

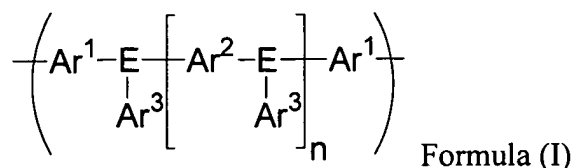
Rejection of Claims 24-30 and 41-43 under 35 U.S.C. §102(b)

Claims 24-30 and 41-43 have been rejected under 35 U.S.C. §102(b) as being anticipated by Woo *et al.*, US Patent No. 6, 309, 763, (hereinafter "Woo").

The Examiner stated (page 5, lines 1-4 of the Office Action mailed on November 14, 2008) that the conjugate groups of Formulas (II) and (III) (reproduced below) of Woo are readable on the first repeating unit of the instant invention, when **each** E is **nitrogen**, each Ar¹, Ar² and Ar³ is the same or different and independently represent an aryl, such as phenyl, and n is zero and one, respectively.



Applicants respectfully disagree with the Examiner's statement. Applicants draw the Examiner's attention to the limitation of independent Claim 24 that **at least one E** in the first repeating unit of Formula (I) (reproduced below) is optionally substituted **phosphorus**.



As noted above, conjugate groups of Formulas (II) and (III) of Woo require that **each E** is **nitrogen**, in contrast with the current application, which requires **at least one E** to be **phosphorus**. Therefore, repeating units of Formulas (II) and (III) of Woo do not anticipate independent Claim 24 of the instant application.

Moreover, Claim 24 and claims dependent thereon are also non-obvious over Woo. There is no suggestion or motivation disclosed in Woo that at least one of the nitrogen atoms in Formula (II) and/or (III) of Woo could be replaced by phosphorous. Woo does not provide any reason to replace nitrogen with phosphorous.

Furthermore, one of the ordinary skill in the art would not have found it obvious to replace nitrogen with phosphorous in Formula (II) and/or (III) of Woo. It is well established in Patent Law that it is improper to assume that different chemical structures would have the same properties, absent a teaching of equivalency in the prior art:

Upon review of this history, we have concluded that generalization should be avoided insofar as specific chemical structures are alleged to be *prima facie* one from the other. [...] [I]n the case before us there must be adequate support in the prior art for the ester/thioester change in structure in order to complete the PTO's *prima facie* case and shift the burden of going forward to the applicant. (*In Re Grabiak*, 226 USPQ 870 at 872 (CAFC 1985)).

The court of *In Re Grabiak* further held:

The Bollinger teaching of various heterocyclic rings containing two sulfur atoms or one oxygen and one sulfur atom, rings which are unlike any part of the Howe molecule, does not suggest the interchangeability of sulfur and oxygen in the ester moiety of the Howe molecule. (*Ibid.*)

Applying In Re Grabiak to the facts of the present case, absent some structure-activity data indicating phosphorous/nitrogen equivalency, it is improper to assume that replacement of one element by another (nitrogen by phosphorous) would result in the similar electroluminescent characteristics for the two polymers. As such, it is not reasonable to expect that the teachings of Woo (nitrogen containing repeat units) could be applied to phosphorous containing units with a reasonable expectation of success (see also Takeda Chemical v. Alphapharm, 492 F.3d 1350, 83 U.S.P.Q.2D 1169 (C.A.F.C. 2007)¹).

Additionally, Applicants invention has numerous advantages over prior art amine-containing polymers as stated on page 14, lines 3-15, of the application as originally filed (reproduced below):

The present inventors have identified numerous advantages of the polymers according to the invention as compared to prior art amine-containing polymers, as follows : The polymers according to the invention have a significantly larger HOMO-LUMO bandgap (Eg) than comparative polymer not containing repeating units according to formula (I) (compare Table 1 below). Furthermore, the polymers according to the invention have bluer 1931 PAL CIE co-ordinates for both photoluminescence (PL) and electroluminescence (EL) (compare Table 2 below).

In addition, the present inventors have found that a small red peak is observed in the electroluminescent spectrum of several amine-containing polymers. In contrast, this peak is absent in the electroluminescent spectra of polymers according to the invention.

Other advantages of the phosphines according to the invention over prior art amines are higher external quantum efficiency and current ca. 2.5 times higher for polymers according to the invention.

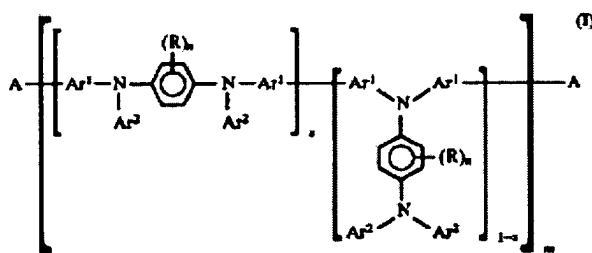
In the view of the above, Applicants submit that independent Claim 24 and new Claim 47 are novel and non-obvious over Woo. Furthermore, Claims 25-30 and 41-43 depend directly or indirectly from independent Claim 24 and, therefore, are also novel and non-obvious over Woo. Reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b) is respectfully requested.

¹ [The] test for prima facie obviousness for chemical compounds is consistent with the legal principles enunciated in *KSR*. [...] Thus, in cases involving new chemical compounds, it remains necessary to identify some reason that would have led a chemist to modify a known compound in a particular manner to establish prima facie obviousness of a new claimed compound. (492 F.3d 1350 at 1356 and 1357)(*emphasis added*)

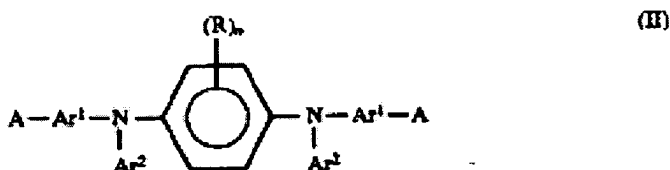
Rejection of Claims 24-30 and 41-43 under 35 U.S.C. §102(b)

Claims 24-30 and 41-43 have been rejected under 35 U.S.C. §102(b) as being anticipated by Wu *et al.*, US Patent No. 5, 728, 801, (hereinafter "Wu").

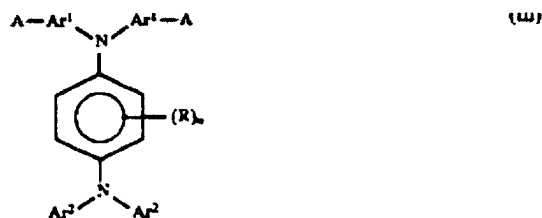
The Examiner stated (page 6, lines 5-9 of the Office Action mailed on November 14, 2008) that Wu teaches a poly(arylamine) composition comprising one or more compound of Formula (I) (reproduced below), which is prepared by bounding about 5 to about 100 monomers illustrated in Formulas (II) and (III) (reproduced below). Furthermore, the Examiner stated (page 7, lines 2-9 of the Office Action mailed on November 14, 2008) that monomer of Formula (II) of Wu is readable on the first repeating unit when each when **each** E is **nitrogen**, each Ar¹ is the same or different and independently represent an aryl, such as phenyl, and n is zero.



Formula (I)

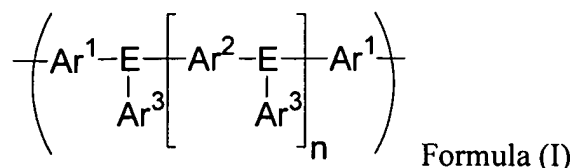


Formula (II) and



Formula (III)

Applicants respectfully disagree with the Examiner's statement. As stated above, Claim 24 requires that **at least one E** in the first repeating unit of Formula (I) (reproduced below) is optionally substituted **phosphorus**.



As noted above, monomer of Formula (II) of Wu requires that **each E** is **nitrogen**, in contrast with the current application, which requires **at least one E** to be **phosphorus**. Therefore, repeating units of Formula (II) of Wu do not anticipate independent Claim 24 of the instant application.

Moreover, Claim 24 and claims dependent thereon are also non-obvious over Wu, for the same reasons discussed in above, with reference to Woo. There is no suggestion or motivation disclosed in Wu to replace at least one of the nitrogen atoms in Formula (II) of Wu with a phosphorous. Furthermore, one of the ordinary skill in the art would not find it obvious to replace nitrogen with phosphorous in Formula (II) of Wu, as discussed previously. In addition, Applicants invention has numerous advantages over amine-containing polymers as stated previously on page 10, of this response.

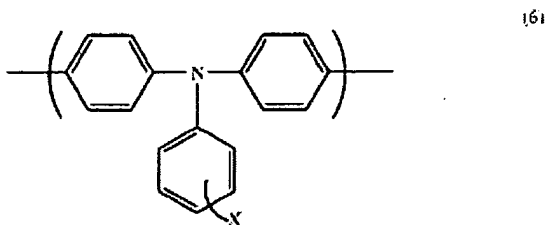
In the view of the above, Applicants submit that independent Claim 24 and new Claim 47 are novel and non-obvious over Wu. Furthermore, Claims 25-30 and 41-43 depend directly or indirectly from independent Claim 24 and, therefore, are also novel and non-obvious over Wu. Reconsideration and withdrawal of the rejection under 35 U.S.C. §102(b) is respectfully requested.

Rejection of Claims 24-30 and 41-43 under 35 U.S.C. §102(e)

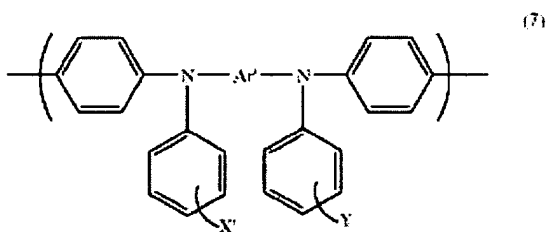
Claims 24-30 and 41-43 have been rejected under 35 U.S.C. §102(e) as being anticipated by O'Dell *et al.*, US Patent No. 7, 351, 788, (hereinafter "O'Dell").

The Examiner stated (page 7, lines 13-14 and page 8, lines 3-5 of the Office Action mailed on November 14, 2008) that O'Dell teaches a method for making a polymer that may contain a first repeat unit of formulas (6) and (7) (reproduced below), wherein the first repeat

unit of formulas (6) and (7) would be readable on the first repeating unit when each when **each E** is **nitrogen**, each Ar^1 , Ar^2 and Ar^3 is the same or different and independently represent an aryl, such as phenyl, and n is zero and one, respectively.

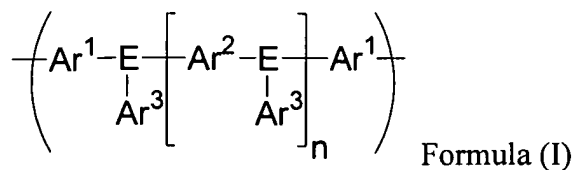


Formula (6) and



Formula (7)

Applicants respectfully disagree with the Examiner's statement. As stated above, Claim 24 requires that **at least one E** in the first repeating unit of Formula (I) (reproduced below) is optionally substituted **phosphorus**.



Formula (I)

As noted above, repeat unit of Formulas (6) and (7) of O'Dell requires that **each E** is **nitrogen**, in contrast with the current application, which requires **at least one E** to be **phosphorus**. Therefore, repeating units of Formulas (6) and (7) of O'Dell do not anticipate independent Claim 24 of the instant application.

Moreover, Claim 24 and claims dependent thereon are also non-obvious over O'Dell, for the same reasons discussed in details above, with reference to Woo. There is no suggestion or

motivation disclosed in O'Dell to replace at least one of the nitrogen atoms in Formula (6) and/or (7) of O'Dell with a phosphorous atom. Furthermore, one of the ordinary skill in the art would not have found it obvious to replace nitrogen with phosphorous in Formula (6) and/or (7) of O'Dell, as discussed previously. In addition, Applicants invention has numerous advantages over prior art amine-containing polymers as stated previously on page 10, lines 7-23, of this paper.

In the view of the above, Applicants submit that independent Claim 24 and new Claim 47 are novel and non-obvious over O'Dell. Furthermore, Claims 25-30 and 41-43 depend directly or indirectly from independent Claim 24 and, therefore, are also novel and non-obvious over O'Dell. Reconsideration and withdrawal of the rejection under 35 U.S.C. §102(e) is respectfully requested.

Rejection of Claims 44 under 35 U.S.C. §103(a)

Claims 44 have been rejected under 35 U.S.C. §103(a) as being unpatentable over either Woo, Wu or O'Dell as applied to the above claims, and further in view of Allen *et al.*, US Patent No. 6, 630, 566, (hereinafter "Allen").

The Examiner stated (page 10, lines 6-9 of the Office Action mailed November 14, 2008) that it would have been obvious to one of ordinary skill in the art to incorporate the polymeric composition of Woo, Wu or O'Dell into a switching device as suggested by Allen because such utility is expressly suggested by the prior arts.

Applicants submit that dependent Claims 44 is novel and non-obvious over Woo, Wu or O'Dell, for reasons discussed in the sections of this paper responding to the novelty rejection over Woo, Wu or O'Dell. Allen does not disclose specific examples of phosphorous containing polymers. Therefore it does not remedy the deficiencies of either Woo, Wu or O'Dell over the claimed subject matter.

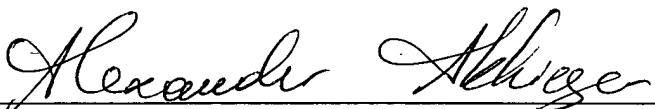
In the view of the above, Applicants submit that Claim 44 is non-obvious over Woo, Wu or O'Dell in further view of Allen. Reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

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